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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/778,595	02/06/2001	Randall G. Mutters	UC2001-209-1	4720

7590 04/17/2003

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EXAMINER

SEVER, ANDREW T

ART UNIT PAPER NUMBER

2851

DATE MAILED: 04/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/778,595	Applicant(s) MUTTERS ET AL.	
	Examiner Andrew T Sever	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-28 is/are allowed.
- 6) ☒ Claim(s) 1-6,9,10,29,30 and 32-34 is/are rejected.
- 7) ☒ Claim(s) 7,8,9, 11, and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 14 May 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>6 & 7</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on May 14, 2001 have been approved. **A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.**

Information Disclosure Statement

2. The Internet addresses provided in the IDS received on Dec. 5, 2001 are no longer valid. The documents are being considered as they have been filed. Applicant is requested to provided updated addresses if known.

Claim Objections

3. Claim 9 objected to because of the following informalities: its dependent claim 1, claims the panels are green whereas this claim (9) claims they are based on yellow reflectance characteristics. Appropriate correction is required.

This claim language is confusing and appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 9, 10, 29, 30, 32, 33, and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Leaf color chart (as provided by the applicant).

The Leaf color chart teaches a leaf color chart that is planar which is rectangular and plastic. It is taught to have a plurality of green color panels, such that the shade of green is relative to the nutrient content in a plant leaf specifically at different nitrogen states as is claimed by applicant's claim 3. (See aside on first page that starts out "Field tests showed that only six color gradients were needed...") It teaches that the panels are green in the fourth paragraph of the main text where it states that "The LCC comes with six color gradients, starting with yellowish green representing the lowest N concentration, and dark green (6) or highest N concentration." The color panels therefore being further based on the yellow spectral reflectance characteristics of the plant leaf at different nitrogen states as is claimed by applicant's claim 9) The color panels are based on the spectral reflectance characteristics of the plant leaf at different nutrient states within the range of visible light and having virtually the same spectral profile as the plant across the range of visible light as is claimed by applicant's claims 2 and 10. (Inherent and since the plastic color chart was developed based on field tests.) With regards to applicant's claims 29, 30, 32, and 33, the method of using and creating the chart in the field is

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inherent, since the chart exists, further although it does not specifically state it, the chart does say that only six color gradients were needed; inherently then for this species of rice six color gradients is the proper gradients and reflects the appropriate range of nutrient states. With regards to applicant's claim 34, 400nm to 700nm is the generally accepted range of visible light, when making a chart for use by a farmer comparing a leaf to a chart with the naked eye; it is inherent that the chart would use visible light for its range.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Leaf Color Chart as applied to claims 1-3, 9, 10, 29, 30, 32, 33, and 34 above, and further in view of Hendrickson et al. (US 6,178,253).

As described in more detail above, the leaf color chart teaches a leaf color chart, which comprises a planar rectangular plastic support structure with a plurality of color panels of different shades of green, each shade of green relative to nutrient content in a plant leaf. The chart is provided so a farmer can easily, cheaply, and without expensive equipment (such as an airplane for aerial photography) determine the nutrient level of a crop and the fertilizer needs of the crop. The leaf color chart only teaches being used specifically for nitrogen.

Hendrickson teaches an aerial method of doing the same. Since Hendrickson's method requires more expensive techniques and equipment, the leaf color chart is a definite improvement, however the leaf color chart uses many of the underlying scientific and basic ideas that Hendrickson does. Hendrickson teaches in column 3 line 54 – column 4 line 7 that the visual assessment of nutrient for nitrogen is also useful for other well known nutrients which are commonly deficient such as sulphur, iron, and other well known nutrients such as phosphorous, potassium, and magnesium (these are well known minerals but are not specifically stated by Hendrickson.) Since Hendrickson teaches that spectral reflectance characteristics can be used to determine nutrient states of different nutrients besides just nitrogen, and since the leaf color chart also teaches as at least potassium and phosphorus are important to plant growth, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the leaf color chart to also provide information about potassium, phosphorus, and/or magnesium states.

Allowable Subject Matter

8. Claims 12-28 are allowed.
9. Claims 7, 8, 11, and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter:

Claims 7, 8, 11, and 31 would be allowable if written in independent form including the matter of their independent base claims. Claims 7, 8, 11, and 31 claim that the leaf color chart also incorporates spectral reflectance characteristics of a red-green chromaticity designation along with the yellow-blue, which the Leaf color chart teaches. This was not found in the prior art of record. The particular leaf color chart used by a farmer is largely a reflection of their particular crop, the chart taught by the Leaf color chart is specifically for Philippine indica rices, where these particular colors may not be useful for that particular chart, however no other systems for monitoring nutrient contents of plant leaf by spectral reflectance characteristics taught using red-green chromaticity either, therefore these claims would be allowable.

Claims 12-28 claim a system and a method for using a system/leaf color chart like that, which was claimed in claims 1-3, 9, 10, 29, 30, 32, 33, and 34 and taught by the "Leaf Color Chart". However they further claim that the charts include a calibration table which comprises an array of nutrient level entries with an indexing number associated with each color panel, such that the user of the color chart can use this number to find on the table leaf nutrient level values in percent and then use an assessment chart comprising a graph of nutrient status based on the leaf nutrient level value derived from the calibration table compared to the plant growth stage for a plurality of variety of plants where the assessment chart has a plurality of colored regions indicative of the nutrient status of the plans as being adequate, critical, deficient, or excessive. This was not found in the prior art of record. The "Leaf Color Chart" only appears to include the instructions that when a certain number of readings occur below a certain number

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fertilizer should be applied. Since no prior art of record taught this limitation or could be used to modify the "Leaf Color Chart" claims 12 and 22 are allowed. Claims 13-21, and 23-28 are dependent on claims 12 and 22 respectively and are therefore also allowed.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4,527,895 to Rubin. Teaches a chart for color matching gems. Possibly could have been used in a 35 USC 103 obviousness type rejection, since like the chart of the present invention, the chart of Rubin seeks to replace a larger mechanical photographic method of determining color by a simple naked eye method.

US 5,470,750 to Bar-Or teaches a chart that uses color comparison to determine the next step for a doctor in relationship to a patient suffering from a possible Appendicitis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 703-305-4036. The examiner can normally be reached M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russell Adams can be reached at 703-308-2847. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

AS

April 14, 2003

A handwritten signature in black ink, appearing to read "Russell Adams", with a stylized flourish at the end.

RUSSELL ADAMS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800